Cost-effectiveness of screening strategies for Chlamydia trachomatis using cervical swabs, urine, and self-obtained vaginal swabs in a sexually transmitted disease clinic setting

Blake DR, Maldeis N, Barnes MR, Hardick A, Quinn TC, Gaydos CA

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
The objective was to examine the cost-effectiveness of Chlamydia screening strategies, using different methods of specimen collection, which were cervical swabs, urine samples, and self-obtained vaginal swabs. The authors concluded that self-obtained vaginal Aptima Combo 2 was the most cost-effective screening strategy from the perspective of the US health care system. The study was generally well conducted and, although some of the data sources were not clearly described, the authors’ conclusions appear to be robust.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to examine the cost-effectiveness of strategies for Chlamydia screening, using different methods of specimen collection: cervical swabs, urine samples, and self-obtained vaginal swabs.

Interventions
Four Chlamydia screening strategies were considered: endocervical deoxyribonucleic acid (DNA) probe; endocervical Aptima Combo 2 (AC2); self-obtained vaginal AC2; and urine AC2. The first two strategies always required a speculum examination, while the latter two strategies required a speculum examination only for symptomatic patients or those due for a Papanicolaou (Pap) smear.

Location/setting
USA/primary care.

Methods
Analytical approach:
The analysis was based on a decision model involving a hypothetical cohort of 10,000 women attending a sexually transmitted disease (STD) clinic. The time horizon of the model was 10 years. The authors stated that the analysis was carried out from the perspective of the public health care payer.

Effectiveness data:
The clinical data were obtained from multiple sources, including primary data, unpublished and local data, and published literature. Specifically, the sensitivity of tests, which was the key clinical input, and other epidemiological data were based on primary data from 324 women attending the Baltimore STD clinic between 2004 and 2005. The sensitivity of the DNA probe was taken from a published study, the details of which were not reported.

Monetary benefit and utility valuations:
Not considered.

Measure of benefit:
The summary benefit measure was the number of cases of pelvic inflammatory disease (PID) prevented. Secondary outcomes, such as PID-related sequelae, were also reported.

Cost data:
The economic analysis included the costs of screening tests, pelvic examination, cervicitis treatment visit, medication for cervicitis, in-patient and out-patient PID treatment, and other treatments for infertility, ectopic pregnancy, and chronic pelvic pain. These costs were based on Medicare reimbursement rates, the literature, and the Health Care Utilization Project. Little information about resource use was provided. It was stated that the time required to perform a speculum examination was based on a time-in-motion study. All costs were in US dollars ($) and the price year was 2006. Future costs were discounted at 3% per annum. Cost-to-charge ratios were applied, when only charge data were available.

Analysis of uncertainty:
One- and two-way sensitivity analyses were carried out on the model inputs, using ranges of values based on published evidence or primary data. The cost-effectiveness threshold was set at $400 per PID case prevented, by the consensus of experts.

Results
In the whole cohort, the total costs were $636,913 with endocervical DNA probe; $627,204 with endocervical AC2; $613,732 with urine AC2; and $573,205 with self-obtained vaginal AC2. The expected PID cases were 115 with endocervical DNA probe; 44 with endocervical AC2; 44 with urine AC2; and 27 with self-obtained vaginal AC2. Thus, endocervical DNA probe was dominated, as all the other strategies were cheaper and prevented more PID cases. The dominant strategy (cheaper and more effective than the other strategies) was self-obtained vaginal AC2.

In general, the base-case results were stable to variations in the model inputs, including disease prevalence, but the size of the savings associated with self-obtained vaginal AC2 changed depending on the parameter varied. Self-obtained vaginal AC2 was no longer dominant, when the sensitivity of urine AC2 was assumed to be higher than that of self-obtained vaginal AC2, or when the sensitivity of endocervical AC2 was set at 99%.

Authors’ conclusions
The authors concluded that self-obtained vaginal AC2 was the most cost-effective screening strategy from the perspective of the US health care system.

CRD commentary
Interventions:
The selection of the comparators was appropriate because the four screening strategies were the available tests in the authors’ setting.

Effectiveness/benefits:
The clinical analysis was mainly based on primary data, which were gathered at a single institution. This source appears to have been representative of the patient population analysed and the sample size was adequate, but few other details were reported. No description of the other published sources was given, which reduces the possibility of judging the validity of the clinical estimates. The authors did not address specific issues related to the use of data from mixed sources, such as heterogeneity of the patient population and the use of different tests. The sensitivity of the DNA probe was taken from a source different to that for the other tests. The benefit measure was disease specific and may not be comparable with the benefits of other health care interventions. The use of natural units (i.e., PID cases prevented) created an issue of the most appropriate threshold for defining the intervention as cost-effective.

Costs:
The economic analysis appears to have been well carried out. All those cost categories relevant to the perspective were included. The unit costs were presented for some items, while for others the costs were given as macro-categories. This approach is usually due to the use of reimbursement data. Other details of the analysis, namely the price year, use of discounting, and cost-to-charge ratios, were reported.

Analysis and results:
The costs and benefits were appropriately reported and were analysed, using an incremental approach that highlighted the dominated alternatives. The issue of uncertainty was analysed using a deterministic approach, which focused on the key model inputs. A more comprehensive methodology would have been helpful, but the results were robust.
authors noted that their findings reflected the experience at a single STD clinic and caution was required if extrapolating them to other health care settings. Comparisons with findings from other studies were reported and discussed.

Concluding remarks:
The study was generally well conducted and, although some of the data sources were not clearly described, the authors’ conclusions appear to be robust.

**Funding**
Funding received from GenProbe, San Diego, CA; and the HIV Prevention Trials Network.

**Bibliographic details**

**PubMedID**
18461013

**DOI**
10.1097/OLQ.0b013e31816ddb9a

**Original Paper URL**
http://journals.lww.com/stdjournal/Fulltext/2008/07000/Cost_Effectiveness_of_Screening_Strategies_for.3.aspx

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Adolescent; Adult; Ambulatory Care Facilities; Chlamydia Infections /diagnosis /economics /epidemiology /prevention & control; Chlamydia trachomatis /genetics /isolation & purification; Cohort Studies; Cost-Benefit Analysis; DNA, Bacterial /analysis; Female; Humans; Maryland /epidemiology; Mass Screening /economics; Pelvic Inflammatory Disease /microbiology /prevention & control; Predictive Value of Tests; Prevalence; Self Administration; Sensitivity and Specificity; Urinalysis /economics /methods; Vaginal Smears /economics /methods

**AccessionNumber**
22008102422

**Date bibliographic record published**
22/04/2009

**Date abstract record published**
10/02/2010